

## **Description of Additional Supplementary Files**

File Name: Supplementary Data 1A

Description: CSV file listing all identified cross-links between residues within proteasomal subunits in cytoplasm.

File Name: Supplementary Data 1B

Description: CSV file listing all identified cross-links between residues within proteasomal subunits in nucleus.

File Name: Supplementary Data 2A

Description: CSV file containing cross-links between proteasome subunits and their direct interacting protein partners in cytoplasm.

File Name: Supplementary Data 2B

Description: CSV file containing cross-links between proteasome subunits and their direct interacting protein partners in nucleus.

File Name: Supplementary Data 3A

Description: CSV file detailing cross-links among proteins within the extended proteasome interaction network in cytoplasm.

File Name: Supplementary Data 3B

Description: CSV file detailing cross-links among proteins within the extended proteasome interaction network in nucleus.

File Name: Supplementary Data 4A

Description: CSV file reporting the Euclidean distances derived from mapping intra-proteasomal cross-links onto available cryo-EM structures of the 26S proteasome in cytoplasm.

File Name: Supplementary Data 4B

Description: CSV file reporting the Euclidean distances derived from mapping intra-proteasomal cross-links onto available cryo-EM structures of the 26S proteasome in nucleus.

File Name: Supplementary Data 5A

Description: CSV file cataloging ubiquitin remnant (Ub-GG or diGly) modifications on proteasomal and ubiquitin-cross-linked proteins with entries for cytoplasmic fraction.

File Name: Supplementary Data 5B

Description: CSV file cataloging ubiquitin remnant (Ub-GG or diGly) modifications on proteasomal and ubiquitin-cross-linked proteins with entries for nuclear fraction.

File Name: Supplementary Data 6

Description: PDB file containing the atomic coordinates used to generate Figure 5, with modeling methods and experimental restraints included in the HEADER section.

File Name: Supplementary Data 7

Description: PDB file containing the atomic coordinates used to generate Figure 6, with modeling methods and experimental restraints included in the HEADER section.

File Name: Supplementary Data 8

Description: PDB file containing the atomic coordinates used to generate Figure 7, with modeling methods and experimental restraints included in the HEADER section.

File Name: Supplementary Data 9

Description: PDB file containing the atomic coordinates used to generate Supplementary Figure 14, with modeling methods and experimental restraints included in the HEADER section.

File Name: Supplementary Data 10

Description: PDB file containing the atomic coordinates used to generate Supplementary Figure 17, with modeling methods and experimental restraints included in the HEADER section.